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***The Association between Domestic Violence, HIV Status and Consent
to Testing Among Zambian Women***

In partial fulfillment of the requirements for the degree of Master of Public Health at
Virginia Commonwealth University

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Abstract

Background: In the past twenty years a global trend has emerged illustrating increasing rates of violence against women. Unfortunately, women around the world are not only experiencing an increase in domestic violence, but also HIV rates. Sub-Saharan Africa carries the heaviest burden of HIV infection, with women disproportionately affected. Despite the significance of the problem, there is scant corpus of literature exploring the influence of domestic violence on HIV. Therefore, this study examined the association between domestic violence and women's decision to consent to HIV testing, and their HIV status.

Methods: The 2007 Zambia Demographic and Health Survey was used for this analysis. This study examined two outcomes; 1) Consenting to HIV testing and 2) HIV status.

The variable defining domestic violence included a positive response to physical, sexual, or emotional abuse by current or ex-husband. Covariates assessed included demographic variables, contraception use, number of sexual partners, and women's opinions on refusing sex with her husband. Survey logistic regression analyses were conducted and OR and 95% CI were calculated.

Results: Women who have experienced domestic violence were 13% more likely to consent to an HIV test (Odds Ratio = .79, 95% Confidence Interval = (0.67, 0.93). Women who had experienced domestic violence were 11% more likely to test positive for HIV (Odds Ratio = 1.09, 95% Confidence Interval = (0.89, 1.33). However, the association did not show statistical significance.

Conclusion: It is encouraging that women who experienced domestic violence were more likely to be tested for HIV. Although not statistically significant, those with domestic violence were more likely to test positive. Future studies are needed to confirm this finding and public health programs should continue to educate the public on the benefits of HIV prevention and the importance of testing.

Introduction

Sub-Saharan African countries carry the heaviest burden of the HIV global pandemic.¹ In 2008, approximately 1.9 million people living in this region acquired HIV, increasing the total number of people living with HIV to 22.4 million.¹ This population accounted for 67% of all HIV infections worldwide.¹ Unfortunately, women are disproportionately affected by HIV in Sub-Saharan Africa, accounting for approximately 60% of the total infected population.¹ The inequality of women is a global issue that crosses into nearly every aspect of society.⁴ HIV infection rates are no exception to this inequity, thereby making it necessary to study HIV as a risk factor for other types of female gender discrimination, such as violence against women. It was just a little over a decade ago that violence against women was finally recognized as an issue of monumental implication to women's health.² In the Sub-Saharan African regions (where HIV is most prevalent), 13-49% of women reported ever being physically assaulted by an intimate male partner.² The wide range in these numbers is partly due to the significant cultural differences in these regions, and therefore it is extremely important to examine data from each locality and intervene accordingly.²

The United Nations Declaration on the Elimination of Violence Against Women defines violence against women as, "any act of gender-based violence that results in, or is likely to result in, physical, sexual or psychological harm or suffering to women."³ While violence against men does indeed occur, it is usually in the form of war, gang and street violence. In addition to the violence that affects men, women are subjected to violence related to gender inequalities resulting from an uneven balance of power between genders, making the issue of violence in women more complex.⁴ Unlike men, women can be controlled simply by a fear of

experiencing physical violence thereby controlling their sexual decision-making.² For example, a survey conducted in the Eastern Cape of South Africa showed that 57% of women believed women cannot refuse sex with their partner.² Women often cited the fear of violence as a barrier to using condoms with their husbands for STI or pregnancy prevention.² It is apparent through the literature that violence against women requires unique responses and solutions that will address the complex nature of the problem.

In the past twenty years, a global trend has emerged that illustrates increasing rates of violence against women.⁴ Despite this documented growth, the nature and sensitivity of this topic leads researchers to believe that these numbers represent an under-report of the actuality.⁴ Violence against women and HIV are both issues of significant public health implications, and thus a relationship between the two has been sparsely suggested throughout the literature, but with minimal evidence.⁵⁻⁸

During the mid nineties when women began to emerge as the population most affected by HIV, researchers began to question the social and psychological consequences of HIV infection among the female population.⁵ Until then, AIDS policy had not recognized the need to distinguish between genders, yet the issue of partner notification and domestic violence highlighted the necessity for this separation.⁵ In 1997, a cross-sectional survey was conducted among a United States population of women: 765 HIV-seropositive and 367 HIV-seronegative women with a history of injection drug use or high risk sex.⁶ The most alarming finding from this study was the high rates of physical and sexual abuse as a child and adult reported by women with and at risk for HIV infection.⁶ However, the finding did not show a statistically

significant association. The authors postulated that the lack of association could possibly be due to the limitations resulting from women not disclosing their HIV test results to partners.⁶

Another study from Nairobi, Kenya evaluated the effects of women being informed of their HIV status after testing, and the reasons why a woman might choose to not learn the results after voluntarily agreeing to be tested.⁷ The study methods had to be altered midway due to the significant number of participating women who experienced violence as a direct result of their HIV positive test result.⁷ A 2002 study in Mombasa, Kenya further added to this conclusion of the impact a mother not learning her HIV status can have on mother-to-child transmission.⁸ The Mombasa study was structured to evaluate the vulnerability of mother-to-child transmission prevention programmes. The results of this analysis supported the Nairobi study by concluding that women are afraid of the violence they may experience if tested positive for HIV infection and prefer to remain unaware of their status, thereby increasing mother-to-child transmission.⁸ Although these studies speculated that there may be an association between HIV and domestic violence, there has been no clear evidence confirming this association. This paper will attempt to investigate that connection by analyzing data from the African country of Zambia.

The Sub-Saharan African country of Zambia lies just north of South Africa, to the east of Angola. Its population stands at 11,862,740; a number plagued by excess mortality due to AIDS.⁹ In 2007, the adult prevalence rate of HIV/AIDS was estimated to be at 15.2%.⁹ Approximately 1.1 million people in this country were living with HIV/AIDS in 2007.⁹ These numbers stand alone in illustrating the monumental impact the HIV pandemic has made in

Zambia. This high prevalence, combined with emerging research linking HIV status to violence against women, makes it necessary to examine the data in Zambia.

In 1999, a population-based HIV survey was conducted in Zambia to examine factors affecting the willingness for HIV-related voluntary confidential counseling and testing (VCT). Readiness of Zambian women for VCT was found to be very low, contrasting significantly from other studies of African populations.¹⁰ In 2004, a cross-sectional study in South Africa evaluated the association of gender-based violence to women's HIV risk.¹¹ Its conclusion was that women with violent or controlling male partners are at increased risk of HIV infection.¹¹ While research is progressing towards a better understanding of the needs and requirements of HIV infected women in this area, there is still much to be done. Thus far, HIV as a risk factor for domestic violence has not been evaluated among this African population. Therefore the objective of this study is to examine whether there is an association between HIV infection and violence among Zambian women. Specifically, two hypotheses will be tested; Hypothesis One: Women who reported domestic violence are less likely to consent to HIV testing; and Hypothesis Two: Women who tested HIV positive were more likely to report domestic violence.

Methods

This study used female respondents from the 2007 Zambian Measure Demographic Health Survey (DHS) (total n = 7,146 women). DHS is a cross-sectional survey that has been in operation since 1984 and provides technical assistance for more than 240 surveys in over 85 countries. Funded by the United States Agency for International Development (USAID), Measure DHS works towards a better understanding of the health and population trends in developing countries.¹² The 2007 Zambian DHS (ZDHS) was the fourth of the Demographic and

Health Surveys to be conducted in Zambia, but only the second including information regarding violence against women and HIV and syphilis testing.¹³ The author of this study acquired permission to analyze this data from Measure DHS.

Sampling and Data Collection

The ZDHS interviewed a nationally representative sample of 7,146 women age 15-49, and 6,500 men age 15-59, representing a response rate of 97% and 91% respectively.¹³ Sampling took place between April and October of 2007. Stratified sampling design was used to select urban and rural populations for each of the nine provinces of Zambia (Central, Copperbelt, Eastern, Lusaka, Luapula, Northern, North-Western, Southern, and Western). Eight thousand households were drawn for the 2007 ZDHS to represent Zambia. All women age 15-49 and all men age 15-59 who were either permanent residents of the households, or visitors present in the household on the night before the survey were eligible to be interviewed. All eligible women and men in each household who gave consent were tested for HIV. In addition to this, one eligible woman per household was chosen at random to be asked additional questions regarding domestic violence.

Three questionnaires were administered; the Household Questionnaire; the Women's Questionnaire; and the Men's Questionnaire. Only the Household Questionnaire and Women's Questionnaire are used for this study. The Household Questionnaire was used to identify all eligible members of the household; gather general information for demographics; and identify individuals eligible for the Men and Women's Questionnaires. From the Household Survey, eligible women who were identified went on to participant in the women's survey. All variables analyzed in this study were gathered in the women's survey. All interviewers, supervisors, and

editors had undergone extensive training regarding interviewing techniques and field procedures.

HIV Testing

All eligible participants of both sexes in each household were given the option of an HIV test. Before consenting, the interviewers explained the procedure, the confidentiality of the data, and the fact that the test results would not be made available to the respondent. Also explained was the option of dried blood spot for additional testing as needed. Once consent was given, a finger prick test occurred and five blood spots were collected on a filter paper card with a unique bar code label linked to the respondent. It was noted on the card if the participant had not given authorization for additional testing. Samples were sent to the Central Statistical Office (CSO) in Lusaka to be logged in and checked, and then onto the Tropical Diseases Research Centre (TDRC) in Ndola to be tested. The protocol for the blood specimen collection and testing for syphilis and HIV was reviewed and approved by the TDRC Ethical Review Committee, the Institutional Review Board of Macro International, and CDC Atlanta.¹³

Variables and Statistical Methods

Two specific aims were examined: 1) to assess the association between domestic violence and decision to consent for HIV testing and 2) to examine the association between domestic violence and HIV status. The variable defining domestic violence included a positive response to physical, sexual, and emotional abuse by current or ex-husband. Consenting to HIV testing and positive result to the test was coded as “yes” and “no” (methods described in previous section).

Age, education, place of residence, wealth, insurance coverage, marital status, number of children, tobacco, refusal to have sex with husband, and a woman justified in asking her husband to use a condom were all examined as possible covariates. While alcohol was identified as a possible confounder and stated as a question in the women's survey, the data set did not include data for this variable, and therefore could not be assessed. Women's knowledge of anyone who had ever been verbally abused for having AIDS was examined as a potential covariate in the association between domestic violence and consenting for HIV testing. Additional covariates tested in the association between domestic violence and HIV positive test included; if the woman's current contraception was effective against HIV, and lifetime number of sexual partners.

Bivariate and multivariate survey logistic regression were conducted and OR and 95% CI were calculated. Logistic regression models provided crude and adjusted estimates of the association between women who had experience domestic violence and women who consented to be tested for HIV, and women who had experience domestic violence and women who tested HIV positive. Potential confounders were retained using the 10% change model and adjusted odds ratios were calculated. Analysis was conducted in SAS Version 9.2

Results

Domestic Violence and Consent to HIV Testing

Out of the 7,146 women who completed the ZDHS 2007 survey, 5,751 (81%) women consented to an HIV test. **Table One** compares the study population by their consent or refusal of an HIV test. Approximately 54% of the women had experienced some form of domestic violence. Out of this population, about 40% were between the ages of 15 and 29, 55% only

reached primary level education, 58% lived in a rural area, and almost all women (92%) had no insurance coverage. Approximately 17% of the women fell into the “poorest” category, while 25% of the women fell into the “richest” category. Over half (62%) of these women were married with a mean number of three children. Nearly all women (98%) did not use tobacco. All of the women believed that there was at least one reason to justify not having sex with your husband, 78% of the women believed a wife was justified in asking her husband to use a condom, and 22% knew someone that had been verbally abused due to AIDS. A statistically significant association was found between consenting status and residence, number of children, tobacco use, and women’s belief in asking a husband to use a condom. All possible confounders were tested using the 10% change rule, but none of the characteristics shown in Table One were confounders.

Table Two illustrates the statistically significant association between women who consented to HIV testing and domestic violence. Women who have experienced domestic violence were 13% more likely to consent to an HIV test (Odds Ratio = .79, 95% Confidence Interval = (0.67, 0.93).

Domestic Violence and HIV Status

Out of the 5,173 women who completed an HIV test, approximately 18% tested positive for HIV. **Table Three** compares this population by HIV status. Of these women 53% were between the ages of 20 and 34, 54% had no education higher than a primary level, 59% lived in rural areas, 92% had no insurance coverage, and nearly all women (98%) did not use tobacco. Over half (62%) of these women were currently married with a mean number of three children. All women believed there was a reason to justify not having sex with your husband, and 79% of

the women believed they were justified in asking their husband to use a condom.

Approximately 83% of these women were not using contraception that was effective against HIV transmission, and the mean number of sexual partners in their lifetime was 2-3. A statistically significant association was found between HIV status and age, education, residence, wealth, insurance status, marital status, tobacco use, condom use, and contraception effectiveness. However, residence presented itself as the only confounder.

Table Two illustrates the association between women who had experienced domestic violence and those who tested positive for HIV. After adjusting for residence as a confounder, women who had experienced domestic violence were 11% more likely to test positive for HIV (Odds Ratio = 1.09, 95% Confidence Interval = (0.89, 1.33). However, after adjusting for residence, the association did not remain statistically significant.

Discussion and Conclusion

This study assessed the association between violence against women and their consent to test for HIV, and the association between domestic violence and HIV status. Among Zambian women, it was found that those who have experienced domestic violence were more likely to consent to an HIV test. It was also determined that Zambian women who tested positive for HIV were more likely to report domestic violence from their partner. However, after adjusting for place of residence, the association did not remain statistically significant.

While studies that investigate the relationship between domestic violence and HIV testing and status in Sub-Sahara Africa are scarce, the findings in this paper illustrate some inconsistencies with the literature that is presented on these issues.^{2,5-8} Studies in Kenya evaluating why women chose not to learn their HIV status after being tested support the

opposite association found in this study.^{7,8} Indeed, one study in Nairobi, Kenya had to alter its methods mid-way through the study as a direct result of the number of women experiencing violence due to their study participation identifying them as HIV positive.⁷ A survey conducted in Zambia in 1999 evaluating factors that affect the willingness for HIV-related voluntary confidential counseling and testing (VCT) showed Zambian women to have very low VCT, which was a significant contradiction in comparison to other African populations.¹⁰ The study postulated that domestic violence may be a potential barrier for testing and counseling. Based on these studies, it was hypothesized that women who had experienced domestic violence were less likely to consent to HIV testing. The findings in this paper conclude that women who reported history of domestic violence victimization were more likely to consent to HIV testing. This could be attributed to one or both of the following reasons; women wanted to prove their fidelity, which if questionable to the husband could be a factor in domestic violence; or women who experience domestic violence are involved in an unhealthy relationship where the husband may not be faithful, and therefore the woman may be concerned about her own HIV status.

While this study reported the opposite association hypothesized in regards to consent to testing, it supports the literature presented on the association between domestic violence and HIV status. The findings of this study are consistent with that of a 1997 cross-sectional survey among United States women that showed high rates of physical and sexual abuse as a child among women with or at risk for HIV.⁶ The results of this paper are also in accordance with a 2004 survey conducted in South Africa which concluded that women with violent or controlling male partners are at increased risk of HIV infection.¹¹ While the authors did not find a statistically significant association between domestic violence and HIV infection, it is

important to note that the lack of association could be due to the lack of consent to be tested by a significant number of the study participants. Nearly half of the women who reported domestic violence refused to be tested, which could have significantly underestimated the association between domestic violence and HIV status.

While there is substantial literature hypothesizing the association between the high rates of HIV infection and domestic violence in the Sub-Saharan populations of Africa, studies measuring the direct association between these two issues are minimal.^{1,2} This study has made a great contribution in examining the associations using a large population dataset.

The strengths of this study include the fact that the Zambian 2007 DHS Questionnaire was a nationally representative sample (urban and rural women were sampled from each of the nine provinces in Zambia) that included a 97% response rate for women, and therefore is generalizable to the population.

The main limitation of this study is that the DHS Questionnaire is self-reported which can result in information bias. Although assured that their answers would be kept in confidence, most likely there were women who did not accurately report their experiences of domestic violence for fear of retaliation from their partners. This limitation would have resulted in an underreporting of the prevalence of domestic violence that could have underestimated the actual relationship of domestic violence to consent for testing and HIV status. Secondly, because the study was cross-sectional, temporality cannot be ascertained between domestic violence and HIV infection. However, it is fairly clear that women must have had the domestic violence experience before consenting for HIV testing. Thirdly, the domestic violence question was only asked to women who had either been previously married, or were

currently married. It excluded women who may have experienced domestic violence from someone other than a current or former husband. Finally, not all women consented to an HIV test. Therefore, women who did not consent may have been HIV positive but would not have been included in the analyses. This also could have resulted in an underestimate of the relationship between HIV status and domestic violence.

This study has several significant public health implications. While it is encouraging that women who experienced domestic violence were more likely to be tested for HIV, the findings in this study are inconsistent with previous literature. As HIV prevention and domestic violence are issues of monumental significance, it is necessary for future research to determine a better understanding of this association in order to cater intervention programs accordingly. Not only is it essential for a woman to know her HIV status in regards to treatment and prevention, but a woman's HIV status can also have significant consequences on her child(ren). Mother-to-child transmission of HIV is one of the main forms of HIV transmission in Sub-Saharan populations and can be directly related to a woman's unknown status.⁸ Finally, with studies such as this one that demonstrate women who have experienced domestic violence are at higher risk of HIV, programs and policy can be catered to intervene in this association and thus ultimately decrease HIV and domestic violence rates. Public health efforts must focus on understanding the relationship between domestic violence and HIV testing in order to combat the unacceptably high rates of these issues among Zambian women.

In conclusion, it is encouraging that women who experienced domestic violence were more likely to be tested for HIV. Although not statistically significant, those with domestic violence were more likely to test positive. Future studies are needed to confirm this finding and

public health programs should continue to educate the public the benefits of HIV prevention and the importance of HIV testing.

Appendix A

Table 1: Comparison of Women by Consent to HIV Testing

Outcome: Consent to HIV Test, n = 7122				
	Total (Percent)	Consent to HIV Test n= 5751 Wt n =5703.78	Refused HIV Test n=1371 Wt n=1422.7	Odds Ratio (95% Confidence Interval)
Exposure Variable=Domestic Violence				
No Domestic Violence	46.3	45.2	51	
Domestic Violence	53.7	54.9	49	1.27(0.69, 0.92)
Age				
Ages 15-19	22	21.81	22.86	
Ages 20-24	19.2	18.62	21.32	1.09(0.92, 1.30)**
Ages 25-29	19.1	19.14	18.79	0.94(0.72, 1.12)
Ages 30-34	14.8	14.94	14.18	0.91(0.74, 1.01)
Ages 35-39	10.5	10.69	9.54	0.85(0.68, 1.06)
Ages 40-44	7.9	8.09	6.98	0.82(0.64, 1.06)
Ages 45-49	6.6	6.71	6.32	0.90(0.69, 1.17)
Education Level				
No Education	10.4	10.22	11.06	1.02(0.75, 1.39)
Primary Education	54.5	53.76	57.36	1.01(0.78, 1.31)
Secondary Education	29.9	30.89	26.15	0.80(0.61, 1.05)**
Higher Education	5.2	5.14	5.43	
Place of Residence				
Urban	42.1	41.07	46.25	
Rural	57.9	58.93	53.75	0.81(0.72, 0.91)**
Wealth				
Poorest	17.4	17.71	15.89	0.89(0.74, 1.07)
Poorer	17.9	18.07	17.4	0.95(0.80, 1.14)
Middle	17.9	17.91	17.9	0.99(0.83, 1.18)
Richer	21.9	21.48	23.72	1.09(0.92, 1.29)
Richest	24.9	24.82	25.09	
Insurance Coverage				
No Insurance Coverage	92	92.04	91.81	0.97(0.78, 1.20)
Insurance Coverage	8	7.96	8.19	
Marital Status				
Never Married	25.9	25.71	26.76	
Currently Married	61.6	61.55	61.98	0.97(0.85, 1.11)
Formerly Married	12.4	12.73	11.26	0.85(0.69, 1.04)
Number of Children				
		3.10(0.04)	2.78(0.07)	3.1(0.04)
Tobacco Use				

No Tobacco Use	98.3	98	99.48	
Tobacco Use	1.7	2	0.52	0.26(0.12, 0.54)**
Refusal of Sex				
Reason to Justify	100	100	100	
No Reason to Justify		0	0	
Condom Use				
Wife Justified Asking	78.1	78.72	75.41	
Wife Not Justified Asking	21.9	21.28	24.59	1.21(1.05, 1.39)**
AIDS Abuse				
Know Someone Verbally Abused because of HIV Status	22	22.16	21.45	0.96(0.83, 1.11)
Do Not Know Someone Verbally Abused because of HIV Status	78	77.84	78.55	

* p < .001
** p < .05

Table 2: Distribution of Exposure by Outcome

Hypothesis 1: Distribution of Domestic Violence Among Women Who Consented to an HIV Test

	Crude OR (95% CI)	Adjusted OR (95%CI)
Exposure		
Domestic Violence	0.79(0.67, 0.93)	No Confounders
No Domestic Violence	1.00(--,--)	1.00(--,--)

Hypothesis 2: Distribution of Domestic Violence Among Women Who Are HIV Positive

	Crude OR (95% CI)	*Adjusted OR (95%CI)
Exposure		
Domestic Violence	1.22(1.00, 1.49)	*1.09(0.89, 1.33)
No Domestic Violence	1.00(--,--)	1.00(--,--)

*Adjusted for Residence

Table 3: Comparison of Women by HIV Status

Outcome: HIV Status, n = 5,713

	Total (Percent)	Positive HIV Test (Percent) n= 947 Wt n=902.28	Negative HIV Test (Percent) n=4766 Wt n=4760.75	Odds Ratio (95% Confidence Interval) Mean (SE)
Exposure Variable=Domestic Violence				
Domestic Violence	55	59	54.1	1.22(1.02, 1.46)
No Domestic Violence	45	41	45.9	
Age				
Ages 15-19	21.8	7.9	24.5	
Ages 20-24	18.6	13.5	19.5	2.15(1.59, 2.92)**
Ages 25-29	19.2	23.8	18.3	4.03(3.04, 5.35)**
Ages 30-34	14.9	24.1	13.2	5.68(4.27, 7.55)*
Ages 35-39	10.7	16.5	9.6	5.35(3.95, 7.24)*
Ages 40-44	8.1	9.1	7.9	3.59(2.56, 5.04)
Ages 45-49	6.7	5.2	7	2.27(1.54, 3.35)**
Education Level				
No Education	10.2	6.9	10.9	0.44(0.30, 0.64)*
Primary Education	53.7	52.4	53.9	0.67(0.50, 0.91)
Secondary Education	31	33.8	30.4	0.77(0.57, 1.05)
Higher Education	5.2	6.9	4.8	
Place of Residence				
Urban	41.1	59.5	37.6	
Rural	58.9	40.5	62.4	0.41(0.36, 0.48)*
Wealth				
Poorest	17.7	9.6	19.2	0.34(0.27, 0.44)*
Poorer	18.1	11.1	19.4	0.39(0.31, 0.50)*
Middle	17.8	14.8	18.4	0.55(0.44, 0.69)
Richer	21.5	30.8	19.8	1.07(0.89, 1.29)*
Richest	24.9	33.7	23.2	
Insurance Coverage				

No Insurance Coverage	92.2	88.8	92.7	0.62(0.49, 0.79)*
Insurance Coverage	7.9	11.2	7.3	
Marital Status				
Never Married	25.7	14.6	27.8	
Currently Married	61.5	55.9	62.6	1.70(1.39, 2.08)*
Formerly Married	12.8	29.5	9.6	5.86(4.63, 7.40)*
Mean Number of Children				
		3.07(0.07)	3.19(0.04)	
Tobacco Use				
No Tobacco Use	98	98.9	97.8	
Tobacco Use	2	1.1	2.2	0.49(0.25, 0.95)**
Refusal of Sex				
Reason to Justify	100	100	100	
No Reason to Justify	0	0	0	
Condom Use				
Wife Justified Asking	78.7	82.8	77.9	
Wife Not Justified Asking	21.3	17.2	22.1	0.73(0.61, 0.88)**
Contraception Effective Against HIV Transmission				
Yes	16.6	29.7	14	
No	83.4	70.3	86	0.39(0.29, 0.52)*
Mean Number of Partners				
		2.66(0.07)	1.88(0.02)	

* p < .001

** p < .05

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